

7 An alternating voltage V varies with time t according to

$$V = 18 \cos 40\pi t$$

where V is in V and t is in s.

(a) For the alternating voltage:

(i) show that the period is 0.050 s

[1]

(ii) determine the root-mean-square (r.m.s.) voltage.

r.m.s. voltage = V [1]

(b) On Fig. 7.1, sketch the variation of V with t for values of t from $t = 0$ to $t = 100$ ms.

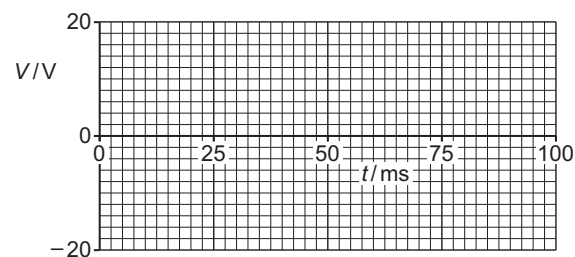


Fig. 7.1

[3]

(c) The alternating voltage is rectified to produce an output voltage across a load resistor R , as shown in Fig. 7.2.

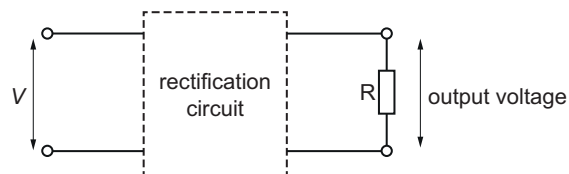


Fig. 7.2

①

Fig. 7.3 shows the variation with t of the power P in the load resistor.

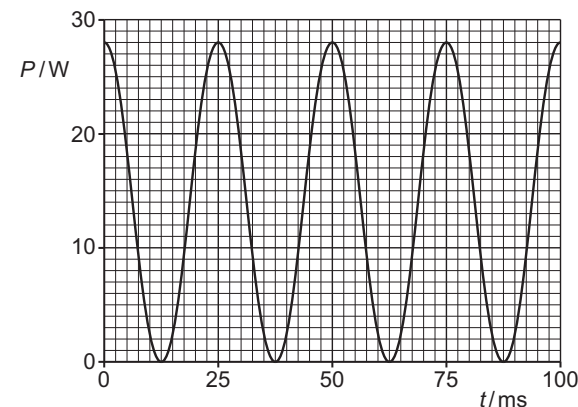


Fig. 7.3

State **three** conclusions that can be drawn from Fig. 7.3. The conclusions may be qualitative or quantitative. Use the space for any working.

- 1
-
- 2
-
- 3
-

[3]

[Total: 8]

②